**Section 1 - Identification**

**Product Identifier:** MACOR

**Glass Code:** 9658  
**Chemical Name:** Glass ceramic  
**Recommended Use:** Used in the manufacture of glass articles

**Manufacturer Information**  
Corning SAS - Specialty Glass  
Phone: 33 (0) 164 454 395  
Rue Saint Laurent  
CS 10243 Bagneaux sur Loing  
F - 77797 Nemours Cedex, France  
Emergency # 24 Hr. Chemtrec (International) (703) 527-3887  
24 Hr. U.S. CHEMTREC: (800) 424-9300

**General Comments**  
NOTE: CHEMTREC telephone number is to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals.

**Section 2 - Hazard(s) Identification**

**Classification in accordance with 29 CFR 1910.1200.**  
No classification is assigned based on classification criteria.  
Review the entire data sheet for any additional information which did not result in a classification.

**GHS LABEL ELEMENTS**

- **Symbol(s):** None  
- **Signal Word:** None  
- **Hazard Statement(s):** None needed according to classification criteria.  
- **Precautionary Statement(s):**  
  - **Prevention:** Avoid breathing dust. Wash thoroughly after handling.  
  - **Response:** Get medical advice/attention if you feel unwell.  
  - **Storage:** None needed according to classification criteria.  
  - **Disposal:** Dispose of contents/container in accordance with local/regional/national/international regulation.  

**Hazard(s) Not Otherwise Classified**  
No additional information is available.

**Section 3 - Composition / Information on Ingredients**

<table>
<thead>
<tr>
<th>CAS</th>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
</table>

Corning Restricted

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Issue Date: 08/21/2015  Revision 2.0000  Print Date: 10/05/2015
Component Related Regulatory Information

This product may be regulated and have exposure limits as identified in Section 8.

Component Information/Information on Non-Hazardous Components

This glass article is a solid material produced by combining various raw materials (e.g. oxides, etc.), melting these components together, and cooling to a non-crystalline solid having its own unique properties. Processing of this article may produce dusts or fumes which are considered hazardous under U.S. 29 CFR 1910.1200 (Hazard Communication) and the Canadian Controlled Product Regulations.

**NOTE:** This component is not a separate component and does not exist in the form of a free oxide, but is included in the glass product. The fluoride component is bound with calcium, potassium, magnesium or aluminum.

### Section 4 - First-aid Measures

**Description of Necessary Measures**

**Inhalation**

If dust is causing irritation, move person to non-contaminated air. Call a physician if symptoms persist.

**Skin Contact**

Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

**Eye Contact**

Eye injuries from glass particles should be treated by a physician immediately.

**Ingestion**

The material is a glass article, and ingestion is unlikely.

**Most Important Symptoms/Effects**

**Acute**

No information on significant adverse effects.

**Delayed**

No information on significant adverse effects.

**Indication of immediate Medical Attention and Special Treatment**

Treat symptomatically and supportively.

### Section 5 - Fire-fighting Measures

**Suitable Extinguishing Media**

Use methods for the surrounding fire.

**Unsuitable Extinguishing Media**

None known.

**Specific Hazards Arising from the Chemical**

Material is not a fire hazard. Material may give off metallic oxides if exposed to high temperatures.

**Hazardous Combustion Products**

Material may form irritating and toxic gaseous oxides at high temperatures.

**Special Protective Equipment and Precautions for Firefighters**

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.
Fire Fighting Measures
Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out.

*** Section 6 - Accidental Release Measures ***

Personal Precautions, Protective Equipment and Emergency Procedures
Avoid breathing dust. Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up
Avoid creating dusts. If glass is crushed and airborne dust can be generated then use a dust suppressant or HEPA vacuum. Place in a closed container. Regulations vary. Consult local authorities before disposal. Glass products may be recycled.

*** Section 7 - Handling and Storage ***

Precautions for Safe Handling
Obtain special instructions for handling glass before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Do not breathe dust. Avoid contact of dust with skin and eyes. Wash hands after handling. Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces.

Condition for Safe storage, Including any incompatibilities
Keep container closed when not in use. Store in a dry area. Store locked up.

Incompatibilities
None known.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Limits
The OSHA air contaminants exposure limits (PELs) are those provided in the 1989 update to 29 CFR 1910.1000. These limits were vacated by OSHA and may not be enforceable.

Component Exposure Limits
Ceramic materials and wares, chemicals (66402-68-4)

ACGIH: 10 mg/m³ TWA (inhalable particles, recommended); 3 mg/m³ TWA (respirable particles, recommended, related to Nuisance particulates)

OSHA: 15 mppcf TWA (respirable fraction); 5 mg/m³ TWA (respirable fraction); 50 mppcf TWA (total dust); 15 mg/m³ TWA (total dust, related to Nuisance particulates)

OSHA (Final): 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction, related to Nuisance particulates)

OSHA (Vacated): 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction, related to Nuisance particulates)

Alberta: 10 mg/m³ TWA (total dust); 3 mg/m³ TWA (respirable, related to Nuisance particulates)

British Columbia: 10 mg/m³ TWA (total dust); 3 mg/m³ TWA (respirable fraction, related to Nuisance particulates)

Manitoba: 10 mg/m³ TWA (inhalable particles, recommended); 3 mg/m³ TWA (respirable particles, recommended, related to Nuisance particulates)

New Brunswick: 3 mg/m³ TWA (particulate matter containing no Asbestos and <1% Crystalline silica, respirable fraction); 10 mg/m³ TWA (particulate matter containing no Asbestos and <1% Crystalline silica, inhalable fraction, related to Nuisance particulates)

NW Territories: 10 mg/m³ TWA (insoluble or poorly soluble, inhalable fraction); 3 mg/m³ TWA (insoluble or poorly soluble, respirable fraction, related to Nuisance particulates)

20 mg/m³ STEL (insoluble or poorly soluble, inhalable fraction); 6 mg/m³ STEL
(insoluble or poorly soluble, respirable fraction, related to Nuisance particulates)

Nova Scotia: 10 mg/m³ TWA (inhalable particles, recommended); 3 mg/m³ TWA (respirable particles, recommended, related to Nuisance particulates)

Nunavut: 5 mg/m³ TWA (respirable mass); 10 mg/m³ TWA (total mass, related to Nuisance particulates)

Ontario: 10 mg/m³ TWA (inhalable); 3 mg/m³ TWA (respirable, related to Nuisance particulates)

Quebec: 10 mg/m³ TWAEV (including dust, inert or nuisance particulates, containing no Asbestos and <1% Crystalline silica, total dust, related to Nuisance particulates)

Saskatchewan: 10 mg/m³ TWA (insoluble or poorly soluble, inhalable fraction); 3 mg/m³ TWA (insoluble or poorly soluble, respirable fraction, related to Nuisance particulates) 20 mg/m³ STEL (insoluble or poorly soluble, inhalable fraction); 6 mg/m³ STEL (insoluble or poorly soluble, respirable fraction, related to Nuisance particulates)

Aluminum compounds (may apply to either metal, oxide, or insoluble compounds). Note that the aluminum in this product is part of the glass product matrix.

ACGIH: 1 mg/m³ TWA (respirable fraction, related to Aluminum)

OSHA (Final): 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

OSHA (Vacated): 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

NIOSH: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable dust, related to Aluminum)

Alberta: 10 mg/m³ TWA

British Columbia: 1.0 mg/m³ TWA (respirable, related to Aluminum)

Manitoba: 1 mg/m³ TWA (respirable fraction, related to Aluminum)

New Brunswick: 10 mg/m³ TWA (particulate matter containing no Asbestos and <1% Crystalline silica)

NW Territories: 10 mg/m³ TWA 20 mg/m³ STEL

Nova Scotia: 1 mg/m³ TWA (respirable fraction, related to Aluminum)

Nunavut: 10 mg/m³ TWA; 5 mg/m³ TWA (respirable mass); 10 mg/m³ TWA (total mass) 20 mg/m³ STEL

Ontario: 1 mg/m³ TWA (respirable, related to Aluminum)

Quebec: 10 mg/m³ TWAEV (containing no Asbestos and <1% Crystalline silica, as Al, total dust)

Saskatchewan: 10 mg/m³ TWA 20 mg/m³ STEL

Yukon: 30 ppmcf TWA (Al₂O₃); 10 mg/m³ TWA (Al₂O₃) 20 mg/m³ STEL (Al₂O₃)

Fluorides

ACGIH: 2.5 mg/m³ TWA (as F, related to Fluorides and Hydrogen fluoride)

OSHA (Final): 2.5 mg/m³ TWA (as F); 2.5 mg/m³ TWA (dust, related to Fluorides and Hydrogen fluoride)

OSHA (Vacated): 2.5 mg/m³ TWA (related to Fluorides and Hydrogen fluoride)

Alberta: 2.5 mg/m³ TWA (as F, related to Fluorides and Hydrogen fluoride)

British Columbia: 2.5 mg/m³ TWA (as F, related to Fluorides and Hydrogen fluoride)

Manitoba: 2.5 mg/m³ TWA (as F, related to Fluorides and Hydrogen fluoride)
Appropriate Engineering Controls
If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eyes/Face Protection
Wear safety glasses with side shields.

Skin Protection
Wear cut resistant gloves when handling glass and appropriate clothing to keep dust from skin.

Respiratory Protection
Not normally needed. If permissible levels are exceeded, use appropriate NIOSH approved dust respirator.

Gloves recommendations
Wear cut resistant gloves when handling and appropriate clothing to keep dust from skin

General Information
Use good hygiene practices when handling this material including changing and laundering work clothing after use.

*** Section 9 - Physical and Chemical Properties ***

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>White solid</td>
</tr>
<tr>
<td>Physical State</td>
<td>Glass</td>
</tr>
<tr>
<td>Vapor Pressure</td>
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<tr>
<td>Boiling Point</td>
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</tr>
<tr>
<td>Solubility (H2O)</td>
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<tr>
<td>Softening Point</td>
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<tr>
<td>Density</td>
<td>2.52 g/cm³</td>
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<tr>
<td>Flash Point Method</td>
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<tr>
<td>Lower Flammability Limit</td>
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<tr>
<td>Odor</td>
<td>None</td>
</tr>
<tr>
<td>pH</td>
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</tr>
<tr>
<td>Vapor Density</td>
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<tr>
<td>Melting Point</td>
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<tr>
<td>Freezing Point</td>
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</tr>
<tr>
<td>Molecular Weight</td>
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<td>Flash Point</td>
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<tr>
<td>Auto Ignition</td>
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</tr>
<tr>
<td>Upper Flammability Limit</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

*** Section 10 - Stability and Reactivity ***

Reactivity
No hazard expected.

Chemical Stability
Stable.

Possibility of Hazardous Reactions
Will not occur.
Conditions to Avoid
None known.

Incompatible Materials
None known.

Hazardous Decomposition Products
At very high temperatures irritating and toxic gaseous metallic oxides can be formed.

** * Section 11 - Toxicological Information * **

Acute Toxicity
Overexposure to dusts of this product may produce eye irritation including redness, scratching of the cornea, and tearing. Mechanical irritation from inhalation of product dust may cause coughing, soreness of throat and nose, and sneezing. Very high exposures may cause difficulty in breathing, congestion, tightness of chest and hemorrhage. Fluoride ingestion may cause acute systemic poisoning. Fluoride has been reported to effect gastric, intestinal, circulatory, respiratory, and nervous systems, as well as skin rashes and complaints related to bones, joints and muscles.

Component Analysis - LD50/LC50
No LD50/LC50's are available for this product's components.

Chronic Toxicity
Repeated inhalation of dust of this product in very large amounts may cause damage to the lung.

ROUTES OF EXPOSURE

Inhalation
Dusts of this product may cause irritation of the nose, throat, and respiratory tract.

Ingestion
May cause temporary irritation of the throat, stomach, and gastrointestinal tract.

Skin
Dust or powder may irritate the skin. Mechanical rubbing may increase skin irritation. No components in this product are known to be absorbed through the skin.

Eyes
Dust or powder may irritate eye tissue. Rubbing may cause abrasion of cornea.

Immediate Effects
respiratory tract irritation, skin irritation, eye irritation

Delayed Effects
No information on significant adverse effects.

Medical Conditions Aggravated by Exposure

Irritation/Corrosivity Data
respiratory tract irritation, skin irritation, eye irritation

Respiratory Sensitization
No information available for the product.

Dermal Sensitization
No information available for the product.

Germ Cell Mutagenicity
No information available for the product.

Carcinogenicity
None identified.
Component Carcinogenicity
   **Fluorides (See NOTE Below) (Not Available)**
   ACGIH: A4 - Not Classifiable as a Human Carcinogen (related to Fluorides and Hydrogen fluoride)

Reproductive Toxicity
   No information available for the product.

Specified Target Organ Toxicity - Single Exposure
   No target organs identified.

Specified Target Organ Toxicity - Repeated Exposure
   No target organs identified.

Aspiration Hazard
   No data available.

Other Toxicological Information
   Under normal conditions of use for glass products, the likelihood of inhaling or ingesting amounts necessary for these effects to occur is very small.

**Section 12 - Ecological Information**

Ecotoxicity
   No information available.

Component Analysis - Ecotoxicity - Aquatic Toxicity
   No ecotoxicity data are available for this product's components.

Environmental Fate
   No information available.

Persistence & Degradability
   No information available for the product.

Bioaccumulation
   No information available for the product.

Mobility
   No information available for the product.

**Section 13 - Disposal Considerations**

Disposal Methods
   You must test your waste using methods described in 40 CFR Part 261 to determine if it meets these or other applicable definitions of hazardous wastes. Waste must be handled in accordance with all applicable regulations. Glass products may be recycled.
   See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

US EPA Waste Number & Descriptions
   You must test your waste using methods described in 40 CFR Part 261 to determine if it meets these or other applicable definitions of hazardous wastes.

Component Waste Numbers
   No EPA Waste Numbers are applicable for this product's components.

Disposal of Contaminated Packaging
   Reuse or recycle if possible. If recycling is not practicable, dispose of in compliance with local regulations. Dispose in accordance with all applicable local regulations.
**Section 14 - Transport Information**

**US DOT Information**
Not regulated as a hazardous material.

**TDG Information**
Not regulated as a dangerous good.

**IATA Information**
Not regulated as dangerous good.

**Section 15 - Regulatory Information**

**U.S. Federal Regulations**
This product contains metal(s), which as dusts, fumes or particulates, is subject to the reporting requirements of Section 313 of SARA and its associated regulations. If the physical form and usage meets the definition of an article, no reporting is necessary.

**Component Analysis**
None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

**SARA 311/312 Hazardous Categories (40 CFR 370 Subparts B and C)**
- **Acute Health**: No
- **Chronic Health**: No
- **Fire**: No
- **Pressure**: No
- **Reactive**: No

**U.S. State Regulations**
Other state regulations may apply. Check individual state requirements.

**Component Analysis - State**
The following components appear on one or more of the following state hazardous substances lists:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>CA</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxides</td>
<td>Not Available</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Fluorides (related to: Fluorides and Hydrogen fluoride)</td>
<td>Not Available</td>
<td>Yes¹</td>
<td>No</td>
<td>Yes¹</td>
<td>Yes¹</td>
<td>No</td>
</tr>
</tbody>
</table>

Not regulated under California Proposition 65.

**Canadian WHMIS Information**
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all information required by CPR.

**WHMIS Classification:**
This product is exempt as an article.

**Component Analysis - WHMIS IDL**
The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:
- **Aluminum Oxides (Not Available)**
  1 %

**Additional Regulatory Information**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>TSCA</th>
<th>DSL</th>
<th>EINECS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceramic materials and wares, chemicals</td>
<td>66402-68-4</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Aluminum Oxides</td>
<td>Not Available</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0 Other: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

Key/Legend
ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CPR = Controlled Products Regulations; DOT = Department of Transportation; DSL = Domestic Substances List; EINECS = European Inventory of Existing Commercial Chemical Substances; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; IATA = International Air Transport Association; mg/Kg = milligrams per Kilogram; mg/L = milligrams per Liter; mg/m³ = milligrams per Cubic Meter; MSHA = Mine Safety and Health Administration; NA = Not Applicable or Not Available; NIOSH = National Institute for Occupational Safety and Health; NJTSR = New Jersey Trade Secret Registry; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; SARA = Superfund Amendments and Reauthorization Act; TDG = Transport Dangerous Goods; TSCA = Toxic Substances Control Act; WHMIS = Workplace Hazardous Materials Information System.

SDS History
Revision 2.0000, 21-AUG-2015: Updated to OSHA GHS format.
Revision 1.0000, 24-OCT-2011: New MSDS.

Other Information
Reasonable care has been taken in the preparation of this information, but Corning makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. Corning makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

End of Sheet C-587